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Using Social Stories to Teach On-Task Behavior and  
Participation Skills with Children on the Autism Spectrum

Rochester Institute of Technology

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By

Melanie L. Washburn

In Partial Fulfillment of the Requirements  
For the Degree of  
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Running head: USING SOCIAL STORIES TO TEACH

Using Social Stories to Teach On-Task Behavior and  
Participation Skills with Children on the Autism Spectrum

Melanie L. Washburn

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### Abstract

Social stories are written and individually tailored to provide individuals with autism with accurate social information to address their deficit areas (Gray, 2000). The purpose of this study was to assess the effectiveness of a social story intervention in increasing socially desirable behavior with two young boys diagnosed with Autism Spectrum Disorder (ASD). The following dependent variables were considered: (1a) body and eye contact, (1b) staying on the topic, and (2) disruptive and perseverative behavior in the classroom. For both participants, there was an increase in social appropriate behavior and a decrease in disruptive behavior over the course of eight weeks as measured by an ABAB design. While the intervention appeared effective in improving body and eye contact, staying on the topic, and disruptive behavior, overall it appeared that the social stories did not cause the change in the behavior. That is, the changes in behavior did not coincide with the presentation and removal of the story.

## Using Social Stories to Teach On-Task Behavior and Participation Skills with Children On the Autism Spectrum

Pervasive Developmental Disorders (PDDs) involve a variety of disruptions in normal development. The Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV) provides a description of PDDs that encompasses a number of disorders: Autistic Disorder, Rett's Disorder, Childhood Disintegrative Disorder, Asperger's Disorder, and PDD Not Otherwise Specified (APA, 2000). These disorders which are believed to be neurobehavioral syndromes caused by a dysfunction in the central nervous system may either have an onset early in life or precede a period of normal development. Each disorder is distinct in onset of symptoms and pattern of behavior (House, 2002).

The onset of symptoms of Autistic Disorder and Asperger's Disorder occurs in the first three years of life and includes three characteristics of impairment: impairment in social interaction, impairment in communication, and restricted repetitive and stereotyped patterns of behavior, interests, and activities. According to the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV), Autistic Disorder is a distinct disorder different from Asperger's Disorder in that symptoms of Asperger's Disorder do not present with impairments in verbal ability or cognitive development that is seen in Autistic Disorder. However, both disorders are collectively termed Autism Spectrum Disorder, or ASD (APA, 2000).

ASD manifests by a qualitative impairment in social interaction exhibited by marked impairment in the use of multiple nonverbal behaviors such as eye contact, facial expression, body postures, and gestures to regulate social interaction; failure to foster



developmentally appropriate peer relationships; lack of spontaneous seeking to share enjoyment, interests, or activities with others; and lack of social or emotional reciprocity. ASD also presents with difficulty in communication resulting from social dysfunction and failure to appreciate and utilize conventional rules of conversation, failure to practice nonverbal cues, and limited capacity for self-monitoring (APA, 2000).

Several more symptoms are common to children with ASD that are not covered by the DSM-IV criteria (House, 2002). These symptoms include unusual responses to sensory stimuli, difficulty attending to unsolicited topics, aggressive outbursts in response to minor changes or frustrations, hyperactivity, anxiety, and self-injurious behaviors. Children with ASD with intelligence quotients over 100 have relative strengths involving an aptitude for rote memory or calculation skills (Cohen & Volkmar, 1987). The DSM-IV states that ASD is a developmental disability that is diagnosed in approximately 1 out of every 2,000 children (APA, 2000). However, more recently the Centers for Disease Control and Prevention (CDC) stated that one in 166 children born today will fall somewhere on the autistic spectrum (Wallis, 2006).

### *Interventions for Individuals with ASD*

There are many types of interventions in the literature focusing on the support of individuals with autism. Some behavioral interventions for students with autism include positive behavioral support, applied behavior analysis, and pivotal response training. Therapeutic and educational interventions include floor time play therapy, occupational and sensory integration therapies, speech therapy, social skills training, and transitional planning. Also, psychotropic medications alone or combined with the above interventions are used (Stewart, 2003).

Rutter (1983) wrote a comprehensive article regarding the treatment of autism that is still relevant today. He suggested that the goal of interventions should be the reduction, rather than the elimination, of rigidity, repetitiveness, and maladaptive behavior patterns intrinsic to individuals with ASD. He invited treatment providers to bring about change by means of a small series of changes that are accepted by the child as not amounting to any noticeable alteration. The targeted outcome is for internal, self-directed control.

Individuals with ASD have the tendency to think concretely rather than symbolically or abstractly (Cohen & Volkmar, 1987). Interventions using visually-cued or symbolic instruction are thought to be an effective instructional strategy for individuals with ASD regarding the pervasive impairment in the social arena (Pierce & Schreibman, 1994; Schuler, 1995; Sigman, Ungerer, Mundy & Sherman, 1987). Instruction using pictorial and visual cues foster organization and skill acquisition, expand socialization, and encourage behavioral control (Quill, 1995). These cues also provide the internal, self-directed control highlighted by Rutter (1983).

Temple Grandin, a woman living with autism, stated that "...words are like a foreign language to me. I translate them into full-color movies, complete with sound, which run like a videotape in my head" (Eldred, 1998, p. 46). Grandin emphasized that individuals with autism have difficulty learning things that cannot be thought about in pictures. Individuals who work with children with autism need to understand how concepts can be formed visually to best teach their students (Eldred, 1998). When instructional strategies incorporate the cognitive processes and social-communication



differences that underlie autism and PDD, individuals may more easily learn, communicate, interact, and develop self-control (Quill, 1995).

Children with autism and PDD display abilities in nonverbal and nonsocial problem solving and have relative strengths in concrete thinking ability, rote memory, and understanding visual-spatial relationships (Quill, 1995). Through the use of visually cued instruction, a child with autism or PDD is lead through the difficulty they may have with the social world. Social stories are homemade pictorial/written short stories that are designed as a means to aid in social development through social understanding. These stories describe social situations, dictate social responses, and explain social perspectives (Gray, 1995).

The social story intervention (Gray, 1995, 2000; Gray & Garand, 1993) was designed to provide people with ASD with missing information about social situations and expectations of others and thus help them foster appropriate behavior and interpersonal understanding. Initially the social stories were created or developed to help students with adjusting to changes, or the stories were used to teach specific social skills as alternatives to problem behavior.

In the decade since their conception, the utility of social stories has expanded to include topics such as decreasing disruptive behavior (Scattone, Wilczynski, Edwards, & Rabian, 2002), teaching choice and play skills (Barry & Burlew, 2004), increasing self-managed coping skills (Haggerty, Black & Smith, 2005), teaching appropriate ways to gain attention (Soenksen & Alper, 2006), promoting independent behaviors in novel events (Ivey, Heflin & Alberto, 2004) and improving sleeping patterns (Moore, 2004).

Most of this research, but not all, centers on the use of social stories with individuals with ASD.

The construction of social stories has changed over the years. Originally, social stories were designed to include three basic sentence types: (a) *Descriptive sentences*, which identify contextual variables of the situation (b) *directive sentences*, which assist in describing desired behavior in response to a social cue or situation, and (c) *perspective sentences*, which identify and describe reactions and feelings associated with the target situation (Gray & Garand, 1993).

Within the stories, the idea is to describe what to do more than to direct the individual (Gray, 2000) and are written with regard to the student's level of comprehension (Gray & Garand, 1993). Gray suggested using a balanced ratio of sentences in each basic social story. This ratio is one directive sentence to every three to five perspective, descriptive, or additional sentences. The additional types of sentences that may be included are: (d) *Affirmative sentences*, which express shared beliefs of a given culture (e) *control sentences*, which provide an individual with understanding through the use of analogies, and (f) *cooperative sentences*, which provide information regarding who would provide support if needed and how that help is provided (Gray, 2000).

The majority of social story research centers on their effectiveness on a wide variety of dependent variables. Many studies have been conducted to evaluate the impact of social stories on improving social skills (Barry & Burlew, 2004; Norris & Dattilo, 1999; Soenksen & Alper, 2006; Delano & Snell, 2006; Swaggart & Gagnon, 1995; Thiemann & Goldstein, 2001;) and many on decreasing disruptive behavior (Kuoch &

Mirenda, 2003; Scattone, Wilczynski, Edwards & Rabian, 2002; Adams, Gouvousis, VanLue & Waldron, 2004; Bledsoe, Myles & Simpson, 2003; Lorimer, Simpson, Myles & Ganz, 2002; Kuttler, Myles & Carlson, 1998; Cozier & Tincani, 2005; Moore, 2004; Agosta, Graetz, Mastropieri & Scruggs, 2004). Other research studies include social stories that have been modified in some way, including musically adapted social stories (Brownell, 2002), stories using a computer-based format (Hagiwara & Miles, 1999), the combination of social stories and apron story telling (Haggerty, Black & Smith, 2005), and the use of social stories and comic strip conversations (Rogers & Miles, 2001).

Smith (2001) added that social stories provide many benefits as an intervention in schools, including the ability to work individually with a child, ease in the creation and production of the stories, the focus on immediate social difficulties, personalization of the teaching of social skills, their ability to be shared jointly, and the focus on real life situations (Smith, 2001). There have been many research studies that support the use of social stories as an evidence-based intervention.

### *Research Synthesis*

Sansosti, Powell-Smith and Kincaid (2004) offered a synthesis of the available research on social stories and their effectiveness in educating children with ASD. The common research designs typically employed are AB designs (Swaggart, Gagnon, Bock, Earles, Quinn, Myles, & Simpson, 1995; Norris & Dattilo, 1999; Moore, 2004), ABAB reversal designs (Kuttler et al., 1998; Lorimer et al., 2002; Adams, Gouvousis, VanLue & Waldron, 2004; Bledsoe, Myles & Simpson, 2003; Ivey, Heflin & Alberto, 2004), variations of the ABAB reversal design (Brownell, 2002; Crozier & Tincani, 2005; Kuoch & Mirenda, 2003; Agosta, Graetz, Mastropieri & Scruggs, 2004; Ivey, Heflin &



Alberto, 2004) and studies using multiple-baseline designs (Hagiwara & Myles, 1999; Theimann & Goldstein, 2001; Scattone, Wilczynski, Edwards & Rabian, 2002; 2002; Soenksen & Alper, 2006; Delano & Snell, 2006; Barry & Burlew, 2004).

The authors concluded that results of previous research should be considered with caution due to lack of experimental control, weak treatment effects, or confounding treatment variables. Future research employing more rigorous experimental control will be required to determine if social stories, in and of them selves, are responsible for changes in behavior (Sansosti, Powell-Smith & Kincaid, 2004).

Nearly all of the research on social story effectiveness employs visual data as a measure. This requires a visual inspection for changes in level, variability, and trend. There are limitations involved in this type of research, as they are not empirical in the sense of having variables manipulated and statistically measured and not subject to rigorous experimental design (Kazdin, 1982).

### *Social Validity*

Smith (2001) investigated the impact of social stories on children's social behavior in a workshop for groups of parents and caregivers, teachers, and learning support assistants about social stories. Nineteen stories were written, implemented, and evaluated for children. The focus of the stories included limiting obsessive behavior, managing dangerous behavior, dealing with lack of compliance with social conventions at home and at school, self-help skills, inappropriate sexual behavior, developing friendships, and supporting transitions. A majority of the trainees found the development of the stories to be enjoyable, practical, and effective. Furthermore, the training

highlighted the importance of initial assessments underlying the individual's social misunderstandings, which lead to the social inappropriate behavior.

### *Increasing social skills*

Several studies have evaluated the effects of social stories on a number of social skills, such as seeking attention, initiating comments, initiating requests and making contingent responses (Thiemann & Goldstein, 2001; Delano & Snell, 2006), greeting responses (Swaggart & Gagnon, 1995), appropriately gaining attention (Soenksen & Alper, 2006), independent participation during novel events (Ivey, Heflin, & Alberto, 2004) social interactions (Norris & Dattilo, 1999), and teaching choice and play skills (Barry & Burlew, 2004). Each study focused on five or less participants and used a variety of experimental designs.

One of the first studies designed to evaluate the effectiveness of social stories was the work of Norris and Dattilo (1999). An AB design was employed with an 8 year-old girl diagnosed with autism. An interval recording procedure was used to measure the frequency of occurrence of appropriate, inappropriate, and absence of social interaction. Although the data was variable, inappropriate social interactions decreased about 50%. As a limitation, treatment integrity and social validity were not assessed. However, this research provided important early insights into the relationship between a social story intervention and social behaviors occurring between a young girl with autism and her non-disabled peers.

Swaggart et al (1995) also evaluated the use of a social story using an AB design. In addition to teaching appropriate behaviors to children with autism, more traditional behavior social skills training were utilized. Stories were paired with additional physical

redirection and verbal prompts to encourage appropriate behavior, social praise, and in one case, a response cost system. The target behaviors included increasing appropriate greetings, sharing materials, parallel play, and decreasing aggression and grabbing. Results were not purported to stand up to rigorous experimental design, but rather were informal classroom-based studies intended to produce functional changes in social behavior. This study supported the use of social stories supplemented by traditional behavior modification techniques for altering behavior (Swaggart et al, 1995).

As opposed to the AB design, Thiemann and Goldstein (2001) employed a more rigorous multiple baseline design. The researchers used social stories with written text cues and video feedback as an intervention to increase social communication for five individuals with autism. The focus was on interactions between students with autism and their peers without disabilities. Appropriate and inappropriate social skills were defined and coded for data collection. Following implementation of the treatment, the participants demonstrated more consistent rates of targeted social behaviors compared to baseline performance. Support was gained for the use of visually cued instruction to guide the social language development of children with autism. A limitation of this study is that it did not examine the effects of the multiple treatments (social stories, script fading, and evaluation) separately.

Delano and Snell (2006) expanded on Thiemann and Goldstein's (2001) study. A multiple-probe design across participants was utilized as an intervention to increase the frequency of engagement and social skills with peers in three elementary students with autism. The intervention consisted of reading individualized stories, answering comprehension questions pertaining to the story, and participating in a ten-minute play



session. Data was collected on the same dependent measures (e.g. seeking attention, initiating comments, initiating requests and making contingent responses) as Thiemann and Goldstein (2001).

The number of target behaviors increased after the intervention was introduced and suggested that the use of social stories without additional social skill intervention may be effective tool to increase social engagement and specific social skills. The social stories were not evaluated as the sole independent variable in this study, as two of the three participants were also involved in a trial program focusing on language and academic skills. Also contributing to the study's limitations was the generalizability of the results to other children with autism and to other behaviors not under investigation in this study (Delano & Snell, 2006).

Soenksen and Alper (2006) utilized a multiple baseline across settings design to determine the efficacy of a social story in the participants' math lesson, recess, and choice time study. The effectiveness of social stories was assessed with a participant other than one diagnosed with ASD or PDD; the student was diagnosed with hyperlexia. Hyperlexia defines a student who has the ability to read words significantly above what is expected for their age and IQ level, but with little or no comprehension of what they are reading. The intervention consisted of the use of a social story in teaching ways to appropriately gain attention of peers. Dependent variables in this study consisted of the number of attempts made to obtain peer attention during a 15 minute observation period.

Results suggested that there was a positive increase in the dependent variable across recess, math, and choice time. This study is noteworthy due to the fact that the social story was operationally defined in great detail and represents empirical

documentation of the effects of social stories on directly observable and measurable behaviors. Only one child was used in this study, only two behaviors were monitored, and all three settings were in school (Soenksen & Alper, 2006).

Barry and Burlew (2004) used an ABCD multiple baseline design and focused on two participants with severe autism. A five-point scale was utilized to assess levels of prompting for choice-making and appropriate play. Variables were measured by the number of minutes engaged in interaction with the materials and/or peers in ways that same-age peers would typically exhibit, which included attention to the materials, leaving the center, or initiating self-stimulatory behavior.

Results demonstrated gains for both participants in the ability to make independent choices and to play appropriately. Limitations include cumulative effects of the intervention, peer modeling and other influences present in the classroom setting. The study contributes to the growing empirical evidence for the use of social stories to increase appropriate social behavior (Barry & Burlew, 2004).

In contrast to the above research, Ivey, Heflin and Alberto (2004) used a reversal ABAB design with three participants to determine the effectiveness of a social story to promote independent behaviors in novel events. Four novel events were targeted: Setting changes, novel toys presented by an unfamiliar person, purchases, and novel activities occurring during the session. The presence or absence of specific “participation skills” was collected via event recording procedure. These five participation skills were: On-task behavior, use of appropriate target vocabulary word, completion of two key tasks depending on the activity, and request for a necessary item.

All three boys evidenced an increase in targeted participation skills when prepared for the novel event using social stories. Novel events in this study were unique to the speech session, but may not have been novel to the child. Also, the ABAB design could have resulted in some carryover effects (Ivey, Heflin & Alberto, 2004).

#### *Decreasing disruptive behavior*

There are many studies that evaluate social stories in regards to decreasing a variety of socially inappropriate and undesirable behaviors. These include reduction of precursors to tantrum behavior (Kuttler, Myles & Carlson, 1998; Lorimer, Simpson, Myles & Ganz, 2002), reducing frequency of specific disruptive target behaviors (Kuoeh & Mirenda, 2003; Scattone, et al., 2002; Crozier & Tincani, 2005; Agosta, Graetz, Mastropieri & Scruggs, 2004), decreasing frustration behaviors in response to homework demands (Adams, Gouvousis, VanLue & Waldron, 2004), decreasing the number of food and drink spills and increasing the frequency of mouth wiping (Bledsoe, Myles & Simpson, 2003), improving sleep problems (Moore, 2004), and decreasing yelling, screaming, crying and loud humming (Agosta, Graetz, Mastropieri & Scruggs, 2004).

One of the earlier studies analyzed the effectiveness of social stories in reducing precursors to tantrum behaviors. Kuttler, Myles and Carlson (1998) analyzed the effects of social stories in two environments: Morning work time and lunchtime. Using a single subject ABAB design, data was collected to determine the frequency of inappropriate vocalizations and dropping to the floor, which served as precursors to tantrum behavior. The social story was effective in reducing these precursors to tantrum behavior in both settings. However, Sansosti, Powell-Smith and Kincaid (2004) commented on a flaw in this study. When immediate changes are seen in levels after starting and removing the



social stories, this suggests that the acquisition of skills may not be maintained without the continual implementation of the social story. Also, the Kuttler et al. study utilized other interventions, such as a token economy, with the social stories. Therefore, determining if the social story was responsible for the change in behavior becomes difficult.

Lorimer, Simpson, Myles and Ganz (2002) also sought to decrease precursors to tantrum behaviors in a young boy with autism. They measured interrupting verbalizations using an ABAB design as well. Interrupting verbalizations and tantrums decreased when the social story was presented but increased when the social stories were withdrawn. Like Kuttler et al. (1998), immediate changes were seen when the story was introduced and taken away, so the same limitation of maintenance of skill acquisition was seen.

Social story studies have been used in other setting in addition to schools. Adams, Gouvousis, VanLue and Waldron (2004) utilized a single subject ABAB design to assess frustration behaviors exhibited by a young child with Aspergers Disorder in the home during homework time. The researchers targeted crying, screaming, falling, and hitting. When the stories were introduced there was a decrease in all frustration behaviors. This study documented a strategy for parents to use deal with frustration behaviors in the home and also demonstrated that multiple behaviors serving the same function can be addressed in a single story format, which has potential to be a more efficient way to address problem behavior.

While most research on social stories has been done with younger students diagnosed with autism, Bledsoe, Myles and Simpson (2003) assessed the utility of a

social story to improve eating behaviors with an adolescent diagnosed with Aspergers Disorder. Using an ABAB design as well, the researchers concluded that the social story led to an increase in appropriate mouth wiping behavior and a decrease in number of food and drink spills during lunch at school. There exists a possibility that the participant's self-motivation and awareness of the connection between his meal time behavior and interaction with his same age peers may have enhanced the effectiveness of the social story. Nevertheless, the study adds to the growing body of literature indicating the use of social stories as an effective means of altering behavior.

Kuoeh and Mirenda (2003) deviated from the ABAB reversal design and instead used two different research designs for three children diagnosed with ASD. Dependent measures varied for each child and included yelling and crying when asked to share toys (Participant One), hands in pants, making sounds, and throwing up at meal time (Participant Two) and cheating, moving game pieces, touching, and making negative comments while playing games with peers (Participant Three).

This study differed from previous studies in that different designs were employed across participants to evaluate the impact of adult attention. An ABA design was used for Participant's one and two, and for the third, an ACABA design was used with the C phase indicating social story plus reminder from adult condition. The stories were read to each participant prior to when the target behaviors typically occurred, and the reader provided a brief commentary on the pictures in the story. When target behaviors occurred, relevant, corrective verbal feedback was delivered as it was in the baseline condition. All participants decreased their rate of problem behaviors when the social story was implemented. The attempt to control for adult attention provided evidence that

the social story was solely responsible for the reductions in target behaviors (Kuoeh & Mirenda, 2003).

Crozier and Tincani (2005) also focused on decreasing disruptive behavior via a social story; specifically, talking out. They used a single subject ABAC reversal design to examine the effects of a modified social story, with and without verbal prompts. The baseline phase (A) was followed by a modified social story (B), back to baseline (A), then a second intervention phase that paired a social story with the addition of verbal prompts (C). The disruptive behavior decreased during phase B, and even greater so during the reintroduction of the social story with verbal prompts. The researchers recommended that when social stories are used in classrooms, teachers should provide regular prompts for students to engage in the appropriate behavior.

Agosta, Graetz, Mastropieri and Scruggs (2004) sought to determine the effectiveness of social stories using a variation of an ABAB reversal design as well. An ABCA design was employed using a tangible reinforcer in addition to the social story in phase C to determine the effect of the reinforcer. The researchers investigated whether the social story would decrease number of screams and increase number of minutes of quiet sitting. The reinforcer consisted of happy face pins and verbal praise that could be exchanged for candy bears. The study also examined teacher and researcher collaboration to determine if an effective partnership could be established so that teachers may become active researchers.

The reinforcer was built into the social story presentation during phase A, but was removed during phase B due to the fact that the participant was not interested in the tangible rewards. The overall number of screams decreased and number of minutes



sitting quietly increased across all phases. It was clear that the change in the participant's behavior was not dependent upon the reinforcement because the decreases remained stable when the reinforcer was removed. Furthermore, all adults involved in the study agreed that the partnership between researcher and teachers was very effective (Agosta, Graetz, Mastropieri and Scruggs, 2004).

Scattone, Wilczynski, Edwards and Rabian (2002) used a multiple baseline design in a traditional social story intervention to decrease disruptive behavior. Three children with a diagnosis of autism participated in a multiple baseline design across participants. The disruptive behavior was assessed by measuring the percentage of disruptive behavior during twenty minute intervals. The disruptive behavior differed among participants and included chair tipping, staring, and shouting. Although level of improvement varied across participants, all demonstrated a reduction in their respective disruptive behaviors.

As opposed to the more complex multiple baseline design used above, Moore (2004) used a simple AB design. The research does give more clout to social stories and demonstrated an intervention with social validity and low level of intrusiveness. He incorporated the use of reinforcement in addition to a social story to determine the effectiveness of social stories in a child diagnosed with a severe learning disability and ASD to improve his sleep behaviors. These behaviors included only sleeping in his parent's room, waking in the night demanding milk, and waking very early. The effectiveness was determined via speed, degree, and durability of effect according to the participant's parents. The participant reverted to sleeping with his mother only twice since the story was introduced.

*Variations on the use of social stories*

Rogers and Myles (2001) discussed the use of comic strip conversation as an addition to social stories to enhance social understanding of a problematic situation with a 14 year-old boy with ASD. The number of redirections and number of minutes tardy decreased over the period of the intervention. The researchers hypothesized that the comic strip conversations, rather than the social story alone, were most helpful for the participant in interpreting social situations. The participant reported enjoying using the comic strips and requested them both at home and at school. While employing a weak AB design with a number of inherent flaws, this study demonstrated how comic strips may be an effective addition to social stories and may be an alternative to the book format of traditional social stories. No functional relationship between the story and comic strip intervention and the improved behavior can be implied.

Another research study that employed an AB design was that of Haggerty, Black, and Smith (2005). The participant was a 6 ½ year old boy diagnosed with learning problems. The researchers used an apron story telling technique in addition to the social story. An apron story board was made out of a dark green canvas apron that the participant could wear so the various scenes could be acted out dramatically while reading the social story. Large felt pieces served as contextual background pieces for the story's setting, such as a tree, a play structure, a desk, and a chair. This technique reinforced the coping strategies through a multi-sensory mode of representation.

The participant's frustration behaviors decreased by 60% after the social story and apron storytelling activity. Also, the duration of the frustration behaviors showed an 82% reduction. Intensity ratings decreased by 79%. The apron storytelling and social story intervention appeared to have a positive effect on decreasing the frustration behaviors and

replacing them with more appropriate coping skills. This study demonstrated how employing an alternative method in addition to the social story may be used to renew interest in a social story and that stories can be effective with populations other than those diagnosed with ASD (Haggerty, Black & Smith, 2005).

Brownell (2002) introduced musically adapted social stories to modify the behaviors of four students with ASD. This is the only study to date published using this unique variation. Reading and singing versions of the story were alternately presented to the participants using a counterbalanced treatment order ABAC/ACAB. The differences between baseline (A), traditional social stories (B) and musically adapted social stories (C) were compared. Two participants received the order ABAC and two ACAB to minimize learning or order effects. Data were collected for one hour following each story presentation for five days.

Target behaviors included “TV talk” while at school, listening to the teacher and following directions, and appropriate vocal volume. T-tests revealed the reading and singing conditions were significantly more effective in reducing the target behavior than the no contact control condition (A). The singing condition was significantly more effective than the reading condition alone only in the third case study. During condition C, the participants would mouth the singed words along with the researcher or point to the words as the researcher sang. A guitar was used to accompany the story. The researcher pointed out the spontaneous recall of musical information as the most important part about the musical adaptation (Brownell, 2002).

A multimedia social story intervention was employed by Hagiwara and Myles (1999) to determine the effectiveness of social stories using a computer-based format. A

multiple baseline design across settings was used for three boys with ASD. For Participants One and Two, hand washing was the dependent variable in the study. For Participant Three, on-task behavior was the target behavior. A computer was used to develop the multimedia social story program as well as a video camera to capture the student's actions on film. The multi-media story had a book-like format and included movies of the participants' actions corresponding to the story, sentences read aloud by a computerized voice, and a button clickable by the participants to go through the pages.

Participant One demonstrated improvement in hand washing and achieved 100% completion by the end of two intervention settings. He also demonstrated generalization of the newly acquired skill in one setting. Participant Two also demonstrated partial improvements, although not to 100% completion. Participant Three achieved partial improvements as well, but only in two settings. Although the intervention was short in duration and poor generalization to other settings, results revealed that, overall, the social story intervention using a multimedia story program was effective (Hagiwara & Myles, 1999).

### *Conclusions*

Overall, the research on the effectiveness of social stories is substantial. However, with a lack of experimental control, confounding treatment variables, and weak treatment effects, it is difficult to determine whether social stories alone were responsible for the changes in behaviors.

Based on the limited empirical nature of the published studies on social stories, there is a need for research to focus on employing more rigorous experimental control, examining treatment fidelity and treatment integrity, comparing treatment effects with



typical peers, and examining the critical components of effective social stories (Sansosti, Powell-Smith & Kincaid, 2004).

### *Developing evidence-based intervention*

There has been a paradigm shift in regular and special education towards different ways of providing services due to problems in current practices (Sheridan & Gutkin, 2000). Some of these problems include absence of accountability, focus on service delivery rather than outcomes, and a large gap between what is known about effective behavior and instructional principles and what is implemented in typical practices (Reschly, 2000). *A New Era: Revitalizing Special Education for Children and Their Families* (2002), The President's Commission on Excellence in Special Education Report emphasized the implementation of empirically validated instructional and behavioral interventions. The key to this challenge to improve services to children in schools lies in the adoption of research-based practices (Reschly, 2004).

The central role of practitioners in the research process is to discover intervention programs and strategies that add to the research base for student referral concerns. It is important as well, to evaluate these interventions to determine their use in the classroom and determine their social validity. Current trends call upon a framework to extend the role of practitioners in the research process beyond the passive consumer. Single subject research designs are an important area to consider in gathering more support for evidenced based practices in intervention (Kratochwill & Shernoff, 2004).

The rationale for the current study was to add to the research base of school psychology and to provide information to school psychologists of how to implement practical, evidence-based interventions in real-world settings. There are an abundance of

studies that point to the need for evidence based practices in the area of school psychology (Christenson & Carlson, 2005; Carlson & Christenson, 2005; Gresham, 2004; & Walker, 2004). The critical components of social stories determined by Carol Gray (1993, 1998) include a balanced ratio of basic sentence types (descriptive, directive, and perspective). If social stories constructed with these critical components can be effectively used in classroom settings to alter the social behavior of students, social stories may be an evidenced-based tool to be implemented by school psychologists.

The purpose of the current study was to evaluate the use of a social story intervention to teach appropriate social behavior in the classroom to two boys with ASD. The first case study focused on increasing body and eye contact and staying on the topic and the second was on decreasing disruptive behavior. The independent variable was the presentation of a social story and the dependent variable was the frequency of the target behavior.

### Method

#### *Participants.*

The participants were two students from two different classrooms from the Treatment and Education of Autistic and Related Communication/Handicapped Children (TEACCH) program in an Upstate New York school district. Both classrooms consisted of 6 students, one special education teacher, and four to five paraprofessionals. Parental consent was obtained for each participant. Participant One was eight years old and Participant Two was 11. Both students were capable of communication via speech and mainstreamed into regular education classes and/or specials with a 1:1 Aide for half day support if needed.



**Participant One.** Participant One was an 11 year-old White male diagnosed with Pervasive Developmental Disorder Not Otherwise Specified at the age of four, with symptoms and behavior considered to be on the high end of the Autism Spectrum. According to the teachers, speech therapist and school psychologist, he had significant difficulties with topic maintenance, turn taking, and repair skills. He conversed in an egocentric style, and seemed unaware of others' needs. His Full Scale Score on the Wechsler Intelligence Scale for Children-Fourth Edition (WISC-IV) was an 89, with a range from 70 to 102. Scores on the Receptive and Expressive One Word Picture Vocabulary Test were 103 and 106. Participant One received fourth grade reading and math included in the mainstream classroom.

**Participant Two.** Participant Two was an 8 year-old White male diagnosed at age two with Autism Spectrum Disorder. According to his recent psychological evaluation on January 2005, he had made significant progress since age 4. He was verbal, engaged in reciprocal interactions, and had expanded his range of interests and social skills. He had a high need for order and structure and consistency, and his disruptive behaviors were considered as unintentional acts of defiance. His full Scale Score on the WISC-IV was 60, with a range of 59 to 75. His reading level was around low second grade. Scores on the Receptive and Expressive One Word Picture Vocabulary Test were 77 and 67 respectively. Participant Two mainstreams into Grade One for math and social studies.

### *Research Design.*

An ABAB design was used to evaluate the effectiveness of the two social stories on on-task behavior and participation skills. The first and third phases (A) were baseline conditions. During the second and fourth phases (B), the social stories were read to each

boy three times per week. Throughout the study, data was collected twice weekly for half-hour periods. During the fourth phase, the boys took a copy of the story home and were free to look at it whenever they chose. There was also a copy left in the classroom during phases two and four that the boys could read at their discretion. The intention was to assess treatment reversal during the second (A) condition.

Both participant's teachers and paraprofessionals gave relevant feedback to the participants during data collection. For Participant One, his teacher would intermittently remind him to "focus on the lesson." He was seldom prompted to face the speaker with his body and maintain eye contact.

For Participant Two, feedback included: Using a "1, 2, and 3" system using stickers as an incentive, verbal reminders to participate and listen and/or using a freeze pop or lollipop to quiet him down. With Participant Two, the current system was set up so that if he received an arbitrary number of stickers for the day, he was rewarded with playground or playroom at the end of the day. Throughout the baseline data collection, his teacher and aides would remind him, "Do you want your sticker for morning circle?"

#### *Data Collection.*

Data was collected using an interval recording procedure. For Participant One, thirty minute periods were divided into two minute intervals. When a target behavior was noted during that two minute time period, a check was placed in the appropriate area. This included two target behaviors: (1) Presence of body and eye contact and (2) absence of off the topic comments. See Appendix A for Behavior Data Chart.

For Participant Two, thirty minute periods were divided into one-minute intervals. His behavior occurred more frequently than Participant One, hence the shorter intervals

for data collection. When the target behavior was noted any time during a one-minute interval, a check was placed in the appropriate area. See Appendix B for Behavior Data Chart. For both participants, a tally was made at the end of the data collection period to total the number of target behaviors seen. Data was graphed for visual inspection.

### *Materials.*

Individual social storybooks were written to reflect each participant's target behaviors and interests. As summarized by Appendix C, both stories followed Gray's (2000) basic social story guidelines regarding the proportion of each sentence used. First, drafts of each story were presented to the participants' teachers and aides for feedback and modification. Pictures were taken to include in the stories and hand drawn by the participants to make their stories more appealing. Appendix D contains social stories for both participants.

The social storybooks were printed, laminated, and bound, and printed in 20-point, Times New Roman font. Participant One's story consisted of print and pictures drawn by him. Participant Two's story used print and photographs, and included one picture that he had drawn. Gray recommends a formula to write a good social story is to write a total of at least two to five descriptive and perspective sentences for every directive sentence in the story (Gray, 2000). As summarized in Appendix C, both stories followed these guidelines.

### *Target Behaviors.*

The dependent measures for each child consisted of specific off-task behaviors that occurred in the classroom. For Participant One, the target behavior included lack of body and eye contact when the teacher was speaking and making comments irrelevant to



the topic of the lesson. “Body and eye contact” was generally defined as looking at the speaker (teacher, psychologist, therapist) while they are talking and facing torso, legs and head toward the speaker. The “off topic” behavior included irrelevant vocalizations that were shouted out or spoken after raising his hand. These behaviors were thought to impede his on-task behavior and were recognized by his teacher and speech therapist as an area of weakness.

The target behavior for Participant Two consisted of behavior during lessons in the classroom that interfered with his participation and caused other children in the classroom to have behavioral outbursts. “School play” behavior was operationally defined as repetitive chanting or vocalization of an unusual tone of voice with the use of students and teacher names (past, present, and imagined). This vocalization may include bus names, bus numbers, and school districts; and may include language as if the student’s were being disciplined, such as “You are going to support room!” or “James, no spitting!”

#### *Settings.*

Both participants’ interventions took place in the classroom and were implemented by the researcher. Participant One’s story was presented at variable times during the week, and was read with the researcher two times per week in his classroom at a private work station. Data for Participant One was collected during different group lessons twice per week for thirty minutes. The first group lesson was a psycho-educational lesson and remained consistent from week to week. The second data collection lesson was at a more random time, and was either a lesson by his teacher or group speech therapy.

Participant Two's intervention also took place during the school day. The story was read twice a week by the researcher in a private room. When the story presentation was withdrawn, Participant Two and the researcher still met for thirty minutes twice a week to control for an attention effects. The first observation time was during morning circle in his classroom, and the second was during group speech. These were both times his teacher reported he was having the most difficulty controlling his perseverative school play behavior.

The social stories were constructed according to the basic social story design (Gray, 2000). See Appendix D for story composition. The stories were left in the classroom during the intervention phases (B) so that they could read the story any time during the day and as many times as the participant's wanted to. The social stories were presented three times weekly during B phases of the study. Stories were read by the examiner during one to one time for Participant Two and at random times during the day for Participant One, as he mainstreams for most of the day and has a variable schedule.

#### *Intervention.*

Participant One read the story to the researcher and the story was either read in his classroom in a quiet corner, or in the researcher's office. The social story was read directly to Participant Two while he followed along with his finger. The story was read in a separate room for Participant Two due to his low tolerance for distraction and noise. A brief commentary was provided during the readings related to the content (e.g. "Show me what body contact looks like," and "What does Mrs. B like to see you do?")

#### *Treatment Fidelity.*

The social story intervention was adhered to according to the method section. The stories were read three times a week during Phase B, the intervention phase. It is unknown whether the participants read the stories at home. Their respective teachers reported that they did look at their books several times during the intervention phases but did not record exactly how many times.



## Results

### *Participant One.*

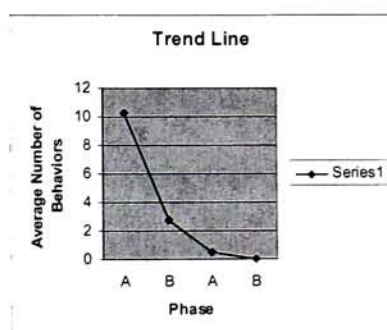
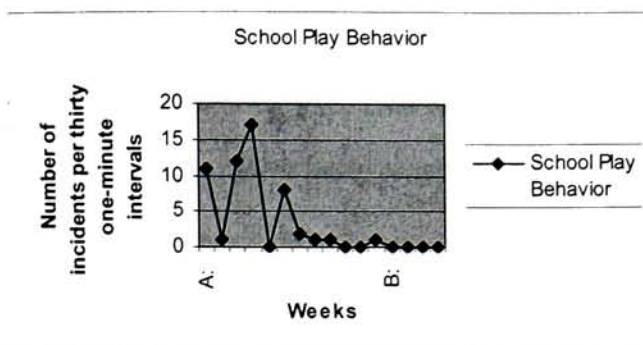
Upon visual inspection of Figure 1 and 2, Participant One's data shows no change in target behavior. However, when percentage of intervals was calculated, an increase in target behavior was noted. Body and eye contact increased from a mean of 65% of intervals during baseline to 73.3% during the first social story presentation to 73.3% when the story was withdrawn and finally to 80.8% when the social story was again presented. On-topic behavior increased from a baseline mean of 71.6% intervals to 75% during social story presentation to 76.6% during the withdrawal phase and finally to 85% upon the second presentation of the social story. As the social story was withdrawn, reversal of the treatment effect did not occur.

### *Participant Two.*

As indicated in Figure 3, during Phase A and B, Participant Two's school play behavior was variable. The average percentage of target behaviors reduced from a mean of 34% of intervals during baseline to 9.2% during the first social story presentation to 1.7% during social story withdrawal and finally to 0% upon reinstating the social story. As the social story was withdrawn, reversal of the treatment effect did not occur. During the second implementation of the social story, the number of incidents of target behavior dramatically decreased and this level was maintained throughout the withdrawal of the social story.



Figure 3. Number of incidents of school play behavior per 30 one-minute intervals



## Discussion

This study investigated how school psychologists can implement a social story intervention with two individuals with ASD. This specific social story intervention studied focused on decreasing disruptive behavior and improving social skills. Throughout the course of the eight-week intervention there was a decrease in disruptive classroom behavior in Participant Two's behavior, and an increase Participant One's socially appropriate behavior; however, there was not demonstration of a functional relationship between the social story and the change in target behavior.

Kazdin (2001) stated that with ABAB designs, a functional relationship is demonstrated if the target behavior changes during each of the phases that the social story is presented, that is, when a social story is withdrawn the target behavior should revert to baseline or near baseline levels. This was not the case with this particular study. Since the behavior did not revert back to baseline after removal of the social story, we cannot conclude that the intervention led to a change in targeted behavior. One possible explanation was that the behavior took a while to change, as students on the autism spectrum often resist change (Rutter, 1983). Another is that due to the high visual memory of children with autism (Rutter, 1983) it is possible that the participant's remembered the story even when it was not being read to them.

Compared with past research, the current study was implemented by a school psychologist in a school-setting. The intervention was viewed in the context of recent push for evidence-based intervention in the "Response to Intervention (RTI) (Fuchs & Fuchs, 2006)" framework. Knowledge of a range of scientifically based interventions and the ability to use these various methods to monitor student progress in behavioral



areas is a key component of schools putting RTI into practice

([http://www.jimwrightonline.com/php/rti/rti\\_wire.php](http://www.jimwrightonline.com/php/rti/rti_wire.php)). This study is one step in attempting to confirm interventions as evidence-based.

One cannot conclude that the intervention in this particular study lead to change in behavior. That is, body and eye contact, on-topic behavior, and disruptive behavior did not change as the story was presented and withdrawn. However, the social stories did show an improvement in social behavior. Utilizing progress monitoring, it was apparent in the trend lines that there was an increase in targeted behaviors. Had the intervention taken place over a longer period of time, these social stories may have been an effective intervention for these two students with autism.

### *Impact of the Intervention*

Participant One showed an increase in appropriate social behavior throughout the study. Participant Two reduced his rate of disruptive school play behavior after the social story implementation. Compared with the first baseline, reduction in “school play” behavior occurred within the first four weeks of the intervention. However, the reduction in both participants’ behavior did not coincide across faces with the presentation and removal of the story.

This data suggests that the social story may have been one contributing factor in the increase in socially appropriate behavior for Participant One, as well as in the reduction in number of intervals of perseverative and disruptive behavior for Participant Two. Phase B for Participant Two consisted of adult attention only, so data from this phase provides support that extra adult attention that accompanied the story was not the sole contributor to the reduction.

### *Limitations of the Study*

The current study has many limitations which may have influenced the results of the study. The study was conducted in a school setting and the researcher was unable to obtain inter-rater reliability. This is a flaw in the study. Inter-rater reliability is important to ensure reliability and validity of the study (Kazdin, 2001). With inter-rater reliability, we could reliably say that the number of incidents of target behaviors was accurately recorded using the interval recording procedure.

The number of participants in the study was limited to two. The participants were mildly impaired and had high verbal communication skills. They were chosen because of the problematic behaviors exhibited and settings were chosen to represent difficult times during the participant's day. Whether or not social stories could benefit all students with autism is unknown at this time.

The nature of the target behaviors was another limitation of the study. For Participant One, it was difficult to measure eye and body contact empirically. Eye contact could have been sustained or momentary, and would be coded the same way. With Participant Two, it was noticed that during the study, he did suppress his school play behavior but substituted it with other equally disruptive behavior that interfered with his ability to participate in class.

There were several confounds to the intervention that may have impacted the results. Participant Two had a concurrent behavioral intervention plan and both participants received individual counseling. It is difficult to unravel the effects of the multiple variables on the changes seen in the participants.

Behavior in the classroom was the context of the intervention. It is unknown whether the stories would generalize to other settings. Often children with autism learn specific skills and have a hard time generalizing them to other settings (Rutter, 1987). Furthermore, it is unknown whether the use of social stories would be effective with individuals with autism with different skills levels.

In conclusion, while the intervention appeared effective in improving the behavior of two individuals with ASD overall, it remains unknown whether it was indeed the social story that caused the change in behavior. Additional research should examine the use of social stories over a longer period of time, across settings and across levels of functioning.

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Appendix A  
Behavior Data Chart  
Participant One

Time	Body and Eye contact		Topic Change	
	Yes	No	Yes	No
12:30-12:32				
12:32-12:34				
12:34-12:36				
12:36-12:38				
12:38-12:40				
12:40-12:42				
12:42-12:44				
12:44-12:46				
12:46-12:48				
12:48-12:50				
12:50-12:52				
12:52-12:54				
12:54-12:56				
12:56-12:58				
12:58-1:00				



Appendix B  
Behavior Data Chart  
Participant Two

9:00-9:01	9:01-9:02	9:02-9:03	9:03-9:04	9:04-9:05	9:05-9:06	9:06-9:07
9:07-9:08	9:08-9:09	9:09-9:10	9:10-9:11	9:11-9:12	9:12-9:13	9:13-9:14
9:14-9:15	9:15-9:16	9:16-9:17	9:17-9:18	9:18-9:19	9:19-9:20	9:20-9:21
9:21-9:22	9:22-9:23	9:23-9:24	9:24-9:25	9:25-9:26	9:26-9:27	9:27-9:28
9:28-9:29	9:29-9:30					

Appendix C  
Composition of Social Stories Used in the Study

Participant	Directive and control sentences	Number of other types of sentences	Ratio of directive and control to other
One	<p style="text-align: center;">Three</p> 1. "I will try to stay on the subject or topic during lessons in Miss Mac's class." 2. "I will try to look at Miss Mac's eyes when she is talking and orient my body toward hers." 3. "This is very important."	18	1:6
Two	<p style="text-align: center;">Four</p> 1. "While at school, I will try hard not to play pretend school." 2. "I will try to participate." 3. "I will try to listen carefully, focus on the work, and follow directions." 4. "This is very important."	15	1:3.75

## Appendix D Social Stories

### Participant One.

My name is Andrew. I am a good, smart boy who likes to connect to other people. In school, Miss Mac's class is a place where I do my work and connect with other people. Connecting means plugging in with my eyes and body, listening closely, and staying on the subject.

Sometimes, Miss Mac teaches the class a lesson. She likes it when each person stays on the subject of the lesson. Then she knows I want to stay connected. When I stick to the topic and stay connected, people know I am smart and want to learn. If she is talking about \_\_\_\_\_, I want to stay on the subject of \_\_\_\_\_.

Another thing Miss Mac likes is when I stay plugged in. Staying plugged in means facing her with my arms, legs, and torso. It also means looking at her eyes and making eye contact when she is talking.

I will try to stay on the subject or topic during lessons in Miss Mac's class. I will try to look at Miss Mac's eyes when she is talking and orient my body towards hers. This is very important. I want to be connected and learn while at school!

All my teachers will probably feel HAPPY if I stay connected and on the topic. These people are Miss Mac, Miss Melanie, Mr. New, Mrs. Wad, Mr. Ryan, Miss Tanya, Miss Mary, and Miss Br.

### Participant Two.

My name is John. I am a good, friendly, smart boy who likes to do the right thing. I go to school almost every Monday, Tuesday, Wednesday, Thursday and Friday.

School is a place where children participate to learn and become smart. Participating means listening quietly, focusing on the work, answering questions, and following directions. Mrs. B likes it when I participate in activities. Then she knows I am ready to learn.

Sometimes, I get stuck when I am at school. I want to play pretend school. When I get stuck, it is hard for me to participate. I want to talk about teachers, buses, and students.

While at school, I will try hard not to play pretend school. This is very important. I will try to participate. I will try to listen carefully, focus on the work, and follow directions. This will help me become smart.

When I get stuck, others can help me by reminding me that I want to focus on the work. I want to participate and become smarter! I feel HAPPY if I participate while I'm at school. My teachers feel HAPPY when I participate while I'm at school. My dad feels HAPPY when I participate while I'm at school. My mom feels HAPPY when I participate while I'm at school.